

1 **(BSP September 27, 2004)**

2 **Pin Bearing**

3 **Shop Drawings**

4 The Contractor shall submit shop drawings to the Engineer for approval in
5 accordance with Section 6-03.3(7). These drawings shall include but not be limited
6 to the following information:

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- 8 1. Plan and elevation of the assembled bearing and each of the components
9 showing dimensions and tolerances.
 - 10 2. Complete details of all components and sections showing all materials
11 incorporated into the bearing.
 - 12 3. All AASHTO, ASTM or other material designations.
 - 13 4. All surface finishes.
 - 14 5. Bearing manufacturer's recommendations and procedures for bearing
15 assembly shipment, storage, and installation.
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18 The Contractor shall not begin fabricating the pin bearings until receiving the
19 Engineer's approval of the shop drawings.

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21 **Shop Inspection**

22 The manufacturer shall provide for inspection. Inspection during the fabrication
23 process shall ensure that the materials and workmanship meet the requirements of
24 the contract. Inspection shall be performed by an independent inspection entity
25 approved by the Engineer.

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27 The Contractor shall submit the name, address, phone number and contact person
28 of the inspection entity performing the required certified shop inspection of the
29 bearings to the Engineer for approval. The Contractor shall not begin bearing
30 fabrication until receiving the Engineer's written approval of the inspection entity for
31 certified shop inspection.

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33 **Flatness and Manufacturing Tolerances**

34 Flatness of bearing surfaces shall be determined by the following method:

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- 36 1. A precision straightedge, longer than the nominal dimension to be
37 measured shall be placed in contact with the surface to be measured as
38 parallel to it as possible.
 - 39 2. A feeler gauge having an accuracy of ± 0.001 inches equal to the
40 tolerance allowed shall be selected and inserted under the straightedge.
 - 41 3. If the feeler gauge does not pass under the straightedge, the surfaces
42 shall be acceptable for flatness.
 - 43 4. In determining the flatness, the straightedge may be located in any
44 position on the surface being measured.
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47 Flatness tolerances shall be defined as follows:

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- 1. Class A tolerance = 0.001 x nominal dimension
- 2. Class B tolerance = 0.002 x nominal dimension
- 3. Class C tolerance = 0.005 x nominal dimension

(Nominal dimension shall be taken as the actual dimension of the plate or sheet under the straightedge, in inches.)

Manufacturing tolerances for the bearings are as follows:

Base Plate, Bearing Plate and Sole Plate

- Plan dimensions
 - Greater than 30 inches: -0.00, +3/16 inch
 - 30 inches or less: -0.00, +1/8 inch
- Thickness: -1/32, +1/8 inch
- Flatness: Class A tolerance, side in contact with steel or PTFE
- Class C tolerance, side in contact with grout or concrete

Guide Bar

- Length: $\pm 1/8$ inch
- Section dimensions: $\pm 1/16$ inch
- Flatness: Class A tolerance, side in contact with steel or PTFE
- Bar to bar tolerance: $\pm 1/32$ inch
- Bars shall be not more than 1/32" out of parallel

PTFE Sheet

- Plan dimensions: Total nominal design area -0, +5 percent
- Thickness: -0.00, +1/64 inch
- Flatness: Class A tolerance
- PTFE Recess: Length and width -0.00, +0.04 inch

Stainless Steel Sheet

- Flatness: Class A tolerance

Bearing Block

- Plan dimensions: -0.00, +1/8 inch
- Thickness: ± 0.015 inch
- Groove radius for pin: As shown in the Plans

Keeper ring grooves in bearing blocks

- Radius, inner and outer: ± 0.005 inch
- Depth of groove: ± 0.010 inch

Keeper Ring

- Radius, inner and outer: ± 0.010 inch
- Thickness: ± 0.030 inch

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Pin
Length, shldr. to shldr.: +0.000, -0.020 inch
Diameter: As shown in the Plans

Overall Height
Total thickness: -1/16, +3/16 inch

The edges of all components shall be broken by grinding so that there are no sharp edges.

Special Fabrication Requirements

When the following components are shown in the Plans as part of the pin bearing assembly, the following special fabrication requirements shall apply:

PTFE Sheet

PTFE shall be 1/8 inch thick unless otherwise noted in the Plans. PTFE shall be recessed and bonded to a depth of one half the PTFE sheet thickness into the backing plate. The exposed height of the PTFE shall not be less than 3/64 inch.

Dimpled PTFE, if shown in the Plans, shall be unfilled and have a minimum thickness of 3/16 inch. Dimples shall be placed in a 1/2 inch grid and shall have a depth of 1/16 inch.

The PTFE sheet shall be recessed and chemically bonded to the supporting steel plate or bar. The woven PTFE sheet shall be mechanically bonded to the supporting steel plate or bar. Bonding shall be performed under controlled conditions and in accordance with the written instructions of the PTFE manufacturer.

Following the bonding operation, the PTFE surface shall be smooth and free from bubbles. Filled PTFE shall be polished after the bonding operation is complete, in accordance with AASHTO LRFD Bridge Construction Specification Section 18.8.3.2.2.

Stainless Steel Sheet

The stainless steel sheet shall be seal welded all around to the supporting steel plate or bar by the gas tungsten arc welding (GTAW) process in accordance with current AWS specifications. The stainless steel sheet shall be clamped down to have full contact with the supporting steel plate or bar during welding. The welds shall not protrude beyond the sliding surface of the stainless steel sheet.

Guide Bar

Each guide bar shall be fabricated from a single steel plate. The guide bars shall be bolted to the pin bearing assembly as shown in the Plans. The stainless steel sheet shall be welded to the guide bar before attaching the guide bar to the pin bearing assembly. The space between the guide bar and the guided component shall be 3/16 inch \pm 1/16 inch.

Corrosion Protection

Steel surfaces, except as otherwise specified, shall be painted in accordance with Section 6-07.3(1), and Section 6-03.3(30) as supplemented in these Special Provisions. The surfaces of all welds fastening stainless steel to structural steel shall be painted as specified for structural steel. Stainless steel shall not be painted. The second and third coats of paint shall be applied after the pin bearing assembly has been erected in its final position with the anchor bolt nuts and pin nuts installed.

The anchor bolts, and associated nuts and washers and pipe assembly, shall not be painted. The upper portion of the anchor bolts, and associated nuts and washers, to six inches minimum below the concrete surface, shall be galvanized after fabrication in accordance with AASHTO M 232.

The following items shall be painted only with one shop applied coat of inorganic zinc primer in accordance with Section 6-07.3(1):

1. The keeper rings.
2. The keeper ring groove surface in the bearing blocks.

The following items and surfaces shall not be painted, but shall instead be coated with #2 extreme pressure grease:

1. The machined surfaces of the bearing blocks that contact the pin and keeper rings.
2. All surfaces of the pins.
3. The threads of the pin nuts.

The primer paint coated keeper rings shall be coated with #2 extreme pressure grease prior to final bearing assembly.

Bearing Assembly Inspection Reports and Certification

The Contractor shall submit the daily inspection reports of the independent inspection entity performing the required certified shop inspection to the Engineer for approval. The daily inspection reports shall report on the shop fabrication and testing activities relating to the bearing assemblies, and their conformance to the specification requirements.

The Contractor shall submit written documentation from the bearing manufacturer certifying that the bearing assemblies have been manufactured in full compliance with the specification requirements.

The Contractor shall not ship the bearing assemblies from the fabricator's facility until receiving the Engineer's approval of the certified shop inspection daily inspection reports and the bearing manufacturer's certificate of compliance.

Bearing Component Assembly, Shipping, and Storage

Each bearing shall be fully assembled at the manufacturing plant and delivered to the construction site as a complete unit, ready for installation. The units shall be

1 held together with removable restraints so that the sliding surfaces are not
2 damaged.

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4 All bearing assemblies shall be marked with the following information prior to
5 shipping:

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7 1. Location of the bearing, including the pier and the specific location along
8 the pier.
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10 2. Direction arrow pointing in the ahead on station direction.

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12 The above information shall be marked on the top plate of the upper unit of the
13 bearing assembly. The marks shall be permanent and shall be visible after bearing
14 installation.

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16 The bearing assemblies shall have centerlines marked on both upper and lower
17 units for checking alignment in the field.

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19 The bearing assemblies shall be shipped in light-proof, moisture-proof and dust-
20 proof containers.

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22 **Bearing Assembly Field Inspection**

23 Field inspection of a representative number of bearings assemblies will be
24 performed by the Engineer. The Contractor shall provide a clean, dry and enclosed
25 area at the site, spacious enough for the field inspection activities. The Contractor
26 shall disassemble and reassemble the bearings for inspection by the Engineer.
27 The disassembly and reassembly of the bearings shall be in accordance with the
28 bearing manufacturer's written procedure and in the presence of the Engineer.

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30 Bearings that fail the inspection shall be replaced or repaired by the Contractor, as
31 approved by the Engineer, at no additional expense to the Contracting Agency. All
32 proposed corrective procedures shall be submitted by the Contractor to the
33 Engineer for approval before beginning corrective work.